



Vol. 13

TAMPA, FLORIDA, APRIL, 1932

No. 4

Annual Meeting Florida State Horticultural Society

The Forty-Fifth Annual Meeting of the Florida State Horticultural Society will be held at Gainesville, Florida, on Tuesday, Wednesday and Thursday, April 19, 20 and 21, 1932, according to announcement made by President John S. Taylor and Secretary Bayard F. Floyd.

The Florida Horticultural Society has played an important part in the growth and development of the citrus industry of Florida, affording as it does a meeting place for the discussion of the many important subjects and problems of moment to the citrus growers of the state. The meeting this year, judged by the program announced, will be quite as interesting and beneficial as any of its predecessors, and it is hoped by the officers that the attendance may equal that of any former gathering.

Held in Florida's University City, the gathering will permit visitors to get first hand information from direct contact with the demonstration work being carried on the agricultural department, the experimental stations and the state plant board.

The official program and announcements follow:

Tuesday Evening, Apr. 19, 7.45 P. M.

Call to Order, Pres. John S. Taylor, Largo.

Invocation, Rev. U. S. Gordon, Gainesville.

Music.

Address of Welcome, Mayor of Gainesville.

Response, S. F. Poole, Lake Alfred.

President's Annual Address.
Music.

Address, Dr. J. J. Tigert, Gainesville.

Address, Judge S. L. Holland, Bartow.

Seventh Annual Florida Rose Show, Hotel Thomas.

Wednesday, April 20, 9:30 A. M.

General Section

Address—"The Role of the Less Common Chemical Elements in Plant Life", Dr. R. V. Allison, Belle Glade.

Address—"Soil Organic Matter", Dr. R. M. Barnette, Gainesville.

Address—"Soil Reaction and Tree Growth", Dr. B. R. Fudge, Lake Alfred.

Address—"Should the Truck Movement of Citrus Fruit be Encouraged or Discouraged?" R. P. Burton.

Address—"The Problems of the Pecan Grower", G. H. Blackmon, Gainesville.

Ornamental Plant Section

H. Harold Hume, Chairman

Address of Welcome, Mrs. B. V. Christensen, President, Gainesville Garden Club.

Address—"The Outdoor Living Room", Mrs. A. G. Cummer, Jacksonville.

Address—"The Iris, Amaryllis and Other Bulbous Ornamentals", E. L. Lord, Gainesville.

Address—"The Garden Club Movement in Florida", Mrs. Chas. W. Ten

Eyck, President Fla. Federation of Garden Clubs.

Address—"Planning the Home Garden", Dr. W. B. Shippy, Leesburg.

Address—"Shrubs for the Home Garden", David K. Stabler, Mountain Lake, Lake Wales.

Address—"Diseases of Ornamental Plants", Dr. W. B. Shippy, Leesburg.

Address—"Water Lilies, Their Place in the Home Garden", Herman Kurz, Tallahassee.

Wednesday, April 20, 2:00 P. M.

General Section

Address—"Cultivation, Cover Crops and Mulching of Citrus Trees", Paul M. Hoenshel, Port Mayaca, W. L. Drew, Eagle Lake.

Address—"Varieties and Practices in the Tung Oil Grove", H. G. Mowry, Gainesville.

Address—"Practical Business End of the Tung Oil Industry", H. W. Bennett, Gainesville.

Address—"Experiences in Tung Oil Culture", Geo. P. Hoffman, Penny Farms.

Address—"Effect of Wrappers on Keeping Quality of Citrus Fruits in Cold Storage", Wm. Fifield, Gainesville.

Address—"Citrus Fruit Juices", Dr. A. F. Camp, Gainesville.

FLORIDA ROSE SOCIETY

Mrs. S. F. Poole, President

President's Address.

Address—"Old Fashioned Florida
(Continued on page 20)

Calcium Requirements of Citrus

E. L. Lord, Professor of Horticulture,
State University of Florida

The topic chosen for discussion is not in any way capable of complete treatment in the present state of our knowledge of the citrus tree, but is so important from a practical standpoint that it deserves more attention than it is at present receiving. While the research in this field is hardly begun, the urgency of the matter is such that it is constantly brought before us, and it is therefore necessary that we make decisions even though they are imperfect, and consequently subject to later revision.

All analyses so far made of the citrus tree show a high Calcium content as compared to the other mineral constituents. Barnette et al. in their study of the mineral content of a nineteen year old grapefruit tree show the calcium content to be more than double the amount of potassium, the next highest element. On the basis of the green weight the percent of calcium averaged 1.127, low in the fibrous fruits the lime content is very high, analyses of fruit grown on certain soils showing calcium nearly as abundant as potassium. Reed and Haas have shown that when there is a liberal amount of calcium and potassium in the nutrient solution the percent of calcium in the ash varies from 18.71 in the leaves to 24.34 in the trunk while the potassium varies from 11.15 in the root to 24.73 in the leaves. This makes it appear that even with young trees it is as important to add calcium as potassium to the soil. It is also interesting to note that the leaves, shoots and rootlets showed the lowest calcium content when this element was left out of the nutrient solution. Reed and Haas also found that when potassium was left out of the solution there was a much greater percentage of calcium in the ash. Leaves of trees to which no potassium was applied were very rich in calcium and those receiving no calcium were high in potassium.

The trees lacking calcium made very poor growth, the leaves dropped off early, often when still quite immature, and the young twigs became entirely leafless. If a large amount of sodium was added to the nutrient solution with calcium omitted, the

leaves showed a striking tendency to mottle before dropping off. This mottling did not occur except when calcium was absent. Multiple buds were produced, and the root growth much restricted. The younger roots became gelatinous and most of the root system died. Reed and Haas have found as high as 60 percent of soluble calcium in the leaves of citrus plants, showing the great power of the plant to absorb calcium. Citrus is also notable in the fact that it shows such great injury when the calcium supply is too low.

Haas and Reed show very definitely that an increasing amount of calcium ions in the solution is reflected in the increased absorption of calcium, but it is by no means proportional to the increased amount. As the solution became more acid the absorption of calcium became more rapid. This agrees with work on other plants. Apparently the rate at which calcium is absorbed depends upon the concentration of calcium in the solution, the hydrogen-ion concentration of the solution, the amount and proportion of other elements present, especially potassium, sodium, and magnesium. The rate of translocation in the tree depends on the rate of transpiration as well as upon the amount already in the tree. There is some evidence to show that the boron present in the twigs affects the rate at which calcium enters the leaves. In cases of calcium deficiency calcium is withdrawn from the older leaves in order to supply the new growth, causing early abscission of the older leaves. Many cases of mottle leaf are apparently induced by heavy applications of lime or may occur on highly calcareous soils where calcium is in too low a concentration either because of high alkalinity or because of the kinds of bases combined in the silicate colloids. At any rate frenching or mottle leaf on this type of soil is accompanied by a low calcium content of the leaf.

Studies were made of lime induced chlorosis of deciduous trees by Wallace. In this work on the apple, pear, plum and raspberry, it was found that where a chlorosis was produced by heavy applications of lime the chlorotic leaves showed a higher percentage of ash than normal leaves, with a marked reduction in calcium

content (about one half normal) and an increase in potassium. The low calcium content of leaves in lime-induced chlorosis of citrus is very similar and it is evident that we have the curious paradox of calcium starvation when these plants are grown in soils with a high content of calcium carbonate. It is not strange that we may find similar frenched leaves also on very acid soils deficient in calcium. The addition of calcium intrate to the acid soils apparently relieves the condition by supplying calcium quickly, while the addition of organic matter or urea, both of which supply CO₂, makes the calcium of calcareous soils available by putting more calcium ions into solution. Before leaving the topic of translocation it is interesting to call attention to the varying amounts of calcium in mature fruits. The immature fruit is very low in calcium, but, as it approaches maturity, there is a rapid migration of calcium into the fruit. The amount which reaches the fruit depends upon the calciums available in the soil and the amount that can be moved from the leaves. It is an interesting matter for conjecture as to whether we can increase the calcium content of the juice by methods of soil amendments, especially since we are advertising this calcium content as a principal factor in the dietetic value of orange juice.

In the analysis made of mature citrus fruits from various sections of Florida by Pickel and Earle the oranges sent in from Rockledge showed 33 percent more lime than those from Sanford, while the potash in the Rockledge oranges was about 35 percent less than that in the Sanford oranges. These differences are hard to account for on the basis of random sampling, especially when it is found that the lime content of oranges from other calcareous soils, such as those of Palestine and California, correspond very closely to the Indian River analyses. If our fertilizer problem could be solved by applying to the soil the same elements that are removed by the fruit we should use a fertilizer (1.6 nitrogen, 1 phosphorus, 6 potash, 2.7 calcium) while California would use (3.4 nitrogen, 1 phosphorus, 4 potash, 2.2 calcium). Of course this is incorrect, but it calls attention to one of the ways in

which heavy bearing orange groves become depleted of calcium.

Much has been said of the necessity of calcium for protein formation, and it is significant that in Citrus the absorption of the nitrate ion increased as calcium was supplied and conversely that the absorption of calcium was stimulated by the presence of abundant quantities of nitrate nitrogen, as shown by Haas and Reed. The lime content of plant proteins is normally low, and it is probable that the calcium helps in the building process or in the removal of waste materials.

While the question of supplying calcium to the plant is an important one, especially when we are working with a plant like citrus which has a high lime requirement, the most significant portion of the calcium problem has to do with the effect of calcium on the soil complex in which the tree is grown. Ignoring for a moment the plant let us take up for consideration the factors affecting the calcium content of soils. It is characteristic generally of soils in arid and semi-arid climates that there is a high content of bases. Conversely soils in humid climates, especially where the temperatures are high, tend to lose bases rapidly, especially calcium, so that the surface soil is usually acid, even when they are of calcareous origin. Turner, working on the soils of Trinidad, points out that there is much evidence to support the idea that hydrogen and calcium account for most of the exchangeable ions in the soils of humid climates, and that on the relative proportion of these two ions the principal properties of these soils depend. He calls attention to the need of maintaining a reserve of calcium carbonate in these soils. Significant increases in crop yields were obtained only on those plots where neutrality had been attained, and the degree of calcium unsaturation of such soils reduced to 20%. As in the cooler portions of the temperate zone, he found that the more fertile soils contained much calcium, and that production on other soils could be increased to compare favorably with the more fertile soils by calcium applications. The effect of calcium carbonate in increasing nitrate formation has been shown by many workers, for example Gaarder and Hagem show that the optimum reaction for the growth of nitrite bacteria is at pH 7.8 (minimum 7.0, maximum 8.6) and of nitrate bacteria the optimum is 7.1 (minimum 6.5, maximum 7.8). These are normal, but by adaptation these organisms may be made to grow in soils far beyond their usual range. Even under acid conditions nitrate

Even under acid conditions nitrate film about the particles of calcium formation may still go on in the carbonate, as shown by Hall and his associates. However in alkaline soils deficient in humus, calcium carbonate may act quite differently by liberating free ammonia from ammonia salts, thereby retarding nitrification. Prescott has shown in Egypt a loss of 47 percent of the ammonia into the air, when sulphate of ammonia is applied to such soils. While calcium carbonate has a very definite effect in increasing the bacterial activity of the soil, Cubbon and others have shown that calcium sulphate has no appreciable influence upon such activity, while Hutchinson, Fischer and others have shown the very definite sterilizing effect of calcium oxide. The number of bacteria is greatly reduced when calcium oxide is applied, although when the calcium oxide is charged in the soil to the carbonate, bacterial activity is greater than before.

Extensive research has shown the effect of calcium salts in reducing toxicity of certain nutrient salts, the work of Breazeale on citrus seedlings being especially noteworthy. It is evident that in certain citrus soils of low water-holding capacity that certain mineral fertilizers can easily surpass the toxic limit in concentration. The addition of calcium salts to such a soil solution raises the toxic limit so that the higher concentrations may occur in the soil without injury. This effect in the toxic limit is not to the neutralization of acidity, as salts which reduce soil acidity are also rendered less toxic when calcium carbonate is added to the soil solution. While calcium nitrate and calcium hydrate also were as effective as calcium carbonate in reducing the toxicity of ammonium salts and sodium nitrate to citrus seedlings, calcium sulphate and calcium chlorid were not at all effective in amounts equal to the other calcium salts but required a concentration of ten times that of calcium carbonate before an equal effect was produced. Breazeale has shown that the problem of toxic limits of the various nitrogen ions is not an academic one, but is actually present under grove conditions. His findings have been verified by other workers, the work of Kearney and Cameron being of especial interest. Incidentally Breazeale found organic matter of no value in decreasing the toxicity of sodium nitrate.

The rate at which calcium is brought into the citrus tree is shown by Haas and Halma in their study of sap concentration of citrus leaves. The total ash of the leaves, the total calcium and the soluble calcium begin

to rise rapidly when growth begins in the spring and continues throughout the summer, decreasing in the fall and winter. When new growth begins the calcium in the stems and older leaves moves into it rapidly, depleting these parts of calcium and, in cases of grave calcium deficiency, causing early leaf fall. As the calcium intake increases, the movement of potassium and magnesium into the parts is materially decreased.

It is difficult to discuss the question of calcium requirement of citrus without discussing Hydrogen-ion concentration. It is well known that the Hydrogen-ion concentration of the soil solution is only a rough guide to the conditions in the soil, but it is evident that it is a valuable index to the proportion of bases and acid in the solution. Unless there is other evidence as to the character of the bases and acids present or absent it is misleading. However this question is more an academic one of interest to the soil chemist rather than a horticultural one at present.

From the growers' standpoint, especially under Florida conditions, the Hydrogen-ion concentration of the soil in the grove gives a workable basis for calcium treatments. In the first place as we have already mentioned the biological activity of the soil is closely associated with Hydrogen-ion concentration. When we have to do with a plant like citrus, which grows better and consistently produces better fruit quality on neutral or slightly basic soils, it is a fruitful topic for consideration as to whether we can alter other soils so that they give similar results, or recommend to growers that they abandon other soils because of the difficulty of altering such soil conditions so that they can compete with growers on favorable soils. Since citrus quality has become an exceedingly important factor in the market it is a noticeable fact that the tenth portion of the citrus production of Florida, that produced on soils containing a high lime content, has consistently received an average of thirty or fifty cents a box more than the fruit from the rest of the state. Adding to this the decreased cost of production and the heavier annual production in such areas it behooves the research activities of the state to either find means to alter the other soils so that they can compete or recommend that the growers abandon citrus production on such soils before they become sub-marginal areas. The program outlined by the citrus fertilizer committee which includes the addition of three tons of organic matter of citrus groves will

(Continued on Page 22)

High Lights of the Citrus Industry's Fight on Insects

By H. J. Quayle
University of California Citrus Experiment Station, Riverside, Cal.

There are five outstanding high lights in the citrus industry's fight on insect pests. Each of these high lights do not represent a narrow and specific field, many of which might be mentioned and which are very important, but broad general principles which apply not only to the citrus industry's fight on pests but to agriculture's fight in general on pests.

The five high lights that I would mention as most outstanding and far-reaching in their application are: (1) The Biological Control of Insect Pests; (2) Hydrocyanic Acid Gas Fumigation; (3) Oil Spraying; (4) Quarantine; (5) The Eradication of Pests.

Biological Control of Insect Pests

In 1872 there was reported a new scale insect that was found on an acacia tree at Menlo Park, California. This three had come from Australia and the pest was called the "Austrian blight," "Austrian bug," "white scale," and "fluted scale," and has now come to be generally known as the "cottony cushion scale." In the early 80s this scale was causing serious injury to citrus trees in southern California and was the object of great concern on the part of the citrus growers. Various sorts of sprays and washes, as well as grass, were tried without success.

In view of the failure of other methods, attention was directed to the possibility of securing parasites to control this scale. Since the scale came from Australia, it was believed that this was the country where the search should be made. Consequently, arrangements were made by the Federal Government and the State of California and in 1888 Albert Koebele sailed from San Francisco on this mission. In the meantime correspondence with Australian scientists had disclosed the fact that there was a little two-winged fly attacking the cottony cushion scale in Australia. Koebele was directed to find this fly and to introduce it into the citrus plantings in California. Several thousands of these flies were liberated later in parts of Califor-

nia where the cottony cushion scale occurred.

While collecting these flies Koebele had noted a ladybird beetle feeding on the cottony cushion scale in Australia, then an unknown enemy of that scale. In 1888 the first lot of these beetles (consisting of 28 specimens) arrived in California. Other lots were sent later and from these over 10,000 specimens were reared and were then liberated on trees infested with the cottony cushion scale. So effective did these enemies of the scale work that within one year the trees were so well freed from this scale pest, which threatened the citrus industry, that the fears of the growers were allayed and the conquest of the plague was in sight.

This ladybird beetle is commonly known as the Vedalia. As a consequence of its introduction the cottony cushion scale was quickly brought under control and has remained under control to this day to such an extent that it is of no consequence whatever as a pest of the citrus industry.

After the cottony cushion scale appeared in California it was later found in Florida and other states, as well as in Spain, Italy and other foreign countries. The Vedalia was sent from California to each of these localities and the history of its phenomenal work in California was repeated in each case. The work of this beetle was so much more conspicuous than the work of the little two-winged fly that the fly was largely forgotten; but the fly is still present in California and also does effective work in checking the scale.

This was the first successful case where one insect had been introduced from a foreign country to prey upon a pest, and it has been the stimulus and the standard of comparison for the enormous development that has taken place in the important field of biological control; not only for citrus pests, but for agricultural pests generally.

Many other important parasites have since been introduced to aid the citrus industry's fight on pests, but none have been so successful as the parasites recently introduced from Australia, to prey upon a species of mealybug. The citrophilus mealybug first appeared on citrus trees in California in 1913. It spread at a rapid

rate until 100,000 acres were infested. The mealybug was not satisfactorily controlled by spraying or fumigating. It was one of the worst of the citrus pests over this 100,000 acres in California.

After exhausting other sources, the Division of Biological Control of the University of California Citrus Experiment Station, in charge of Harry S. Smith, determined that probably Australia was the home of this mealybug, although it was not known to the entomologists there. Anyway, Harold Compere was sent to Australia to see if he could find the citrophilus mealybug in Australia, and, if so, to secure such parasites as might be found attacking it. Compere inherited a natural instinct for searching for parasites from his father, who was a notable parasite collector, and he was immediately successful in locating, on a plant in the Botanical Garden in Sydney, Australia, a small colony of the mealybug, but the mealybug itself was so scarce that he had great difficulty in securing enough mealybugs on which to rear his parasites. After almost giving up in despair, he happened to find, in one of the back yards of Sydney, a small mulberry tree well infested with this mealybug; and to this chance finding probably depends the later successful introduction of the mealybug parasites into California. A total of five parasites were successfully introduced into California, two of which have been chiefly responsible for cleaning up, in the short space of two years, this serious mealybug pest of 100,000 acres of citrus.

Fumigation

Some of the other scale insects of citrus trees in California, such as the red scale and the purple scale, were not successfully controlled by means of sprays and washes and experiments were made with various gases, first by growers and later by D. W. Coquillett of the Federal Government. There was some delay in reporting on this work and the California Experiment Station was also called into the field. F. W. Morse, of the latter institution, began his experiments in the spring of 1887 and soon found that hydrocyanic acid gas was the most successful of the various gases tried. The first published report on fumigation was by

Morse in 1887. However, the previous fall Coquillett, who was at that time temporarily relieved from Government work, had found that hydrocyanic acid gas was the most successful of the gases tried and thus Coquillett is credited with the discovery, as a result of his work in the fall of 1886.

Thus fumigation, which has been the most dependable method for scale control in California, since 1886, and also in Spain, Egypt, South Africa and Australia, is another outstanding contribution in the citrus industry's fight upon pests.

Oil Spraying

There has developed in certain areas of the citrus industry the phenomenon of "resistance" or "tolerance" of insects to certain cyanide. For example, there are three different species of citrus scale insects in California that were formerly very satisfactorily controlled by fumigation and which, in certain areas, are now not successfully so controlled. Where fumigation has failed in these particular areas spraying has been resorted to; but the sprays formerly used did much damage to the tree besides failing to control some of the scales. Gray and de Ong, of the California Experiment Station, found certain impurities in petroleum oils to be particularly injurious to plants. Therefore, highly refined oils are now used on citrus trees with much less injury than occurred heretofore. Such highly refined oils are now used extensively as summer sprays for deciduous trees, so that the application of this finding, first determined on citrus, has now a much broader field.

Quarantine

The introduction of such serious pests as the cottony cushion scale from Australia, the red scale from Australia, the purple scale from Florida, and other pests which early threatened the citrus industry in California, brought prominently to the attention of growers the desirability of keeping out such pests, if it were possible to do so. While the origin of quarantine goes back to legislation pertaining to human diseases, and the first plant quarantine was imposed by France against the phylloxera of the grape, the importance in this country of keeping out pests was greatly stimulated by the introduction of the cottony cushion scale on citrus trees. In Florida and California the citrus industry has been alert from the beginning as to the importance and soundness of the principles of quarantine, and contributed much to fighting the

pests by preventing their entrance. Both states have been staunch supporters of the Federal Quarantine Enactment of 1914, inaugurated and so efficiently administered for many years by C. L. Marlatt.

Eradication of Pests

When quarantine fails to prevent the entrance of a pest as sometimes must occur, the next logical step (if the conditions give any hope of accomplishment) is to eradicate it. Two outstanding instances of eminently successful eradication campaigns must be attributed to the citrus industry's fight on pests.

The first of these is the eradication of the citrus canker, a serious Oriental disease of citrus, that was conducted by the State of Florida under the direction of Wilmon Newell, in cooperation with the Federal Government. This disease had an extensive foothold in that state and the task was so enormous that fed had faith in the final outcome, but its eradication appears to be an accomplished fact.

The second eradication campaign was the one directed against the Mediterranean fruit fly, also by the State of Florida, under the direction of Wilmon Newell and in conjunc-

tion with C. L. Marlatt, then Chief of the Plant Quarantine and Control Administration of the Federal Government. The Mediterranean fruit fly was widely distributed in Florida and the outcome of the campaign seemed much in doubt. It was prosecuted with vigor and thousands of men and millions of dollars were necessary for the fight. But the battle was won in a remarkably short time and the phenomenal success of what seemed to many a hopeless campaign, is the most outstanding accomplishment in the entire history of applied entomology.

The contributions to the citrus industry's fight on pests, as represented by the five high lights I have selected and constituting, as they do, broad general principles of the warfare on pests, are without parallel in any other industry.

A community is as good as its average citizen; wherefore it behooves the community to look well to the average.

A woman never loves a man much whom she does not fear a little.

Chaco

FERTILIZER

Time **MUST** Tell

First made
for our own use;
now the choice
of many.



The Citrus Industry

with which is merged The Citrus Leaf

Exclusive publication of the Citrus Growers and Shippers

Address all communications to the Main Office
1123 Florida Avenue
Tampa, Florida

Telephone _____ 4819

Published Monthly by
ASSOCIATED PUBLICATIONS CORPORATION
Tampa, Florida

S. L. FRISBIE	-	-	-	-	-	President
S. LLOYD FRISBIE	-	-	-	-	-	Secretary-Treasurer
FRANK KAY ANDERSON	-	-	-	-	-	Director
A. G. MANN	-	-	-	-	-	Production Manager

Subscription, \$1.00 per year in advance

Entered as second-class matter February 16, 1920, at the post-office at Tampa, Florida under the act of March 3, 1879.

Branch office and production plant, Bartow, Florida.

NEW YORK OFFICE
118 East 28th Street
Edwin F. Ripley, Manager

CHICAGO REPRESENTATIVE:
Joe Ealer, 5434 Glenwood Avenue
Telephone—Long Beach 3429

CULL FRUIT A MENACE TO THE INDUSTRY

Florida growers of citrus fruits, it appears, are not the only ones who suffer loss by reason of the sale of cull citrus in the markets of the state which the fruit is grown. It is no uncommon thing for Florida citrus growers to hear from the mouths of our winter visitors grievous complaint of the quality of citrus fruits offered in Florida stores and markets. "Why can't we buy good Florida fruits in Florida stores as we buy at home?" is not a infrequent question. The answer, if we are honest with ourselves, must be: "Because Florida markets are flooded with cull fruit which does not go to Northern markets."

That the same condition holds true in Texas at least is evident from an article by C. E. Langstreth appearing in a late issue of the Mission Times, published in the very heart of Texas grapefruit production. Among other things Mr. Langstreth says:

"Without a doubt the most important question confronting the Valley today is 'Why isn't the State of Texas sold on Valley Citrus?' and the reason for this.

"To my mind there is but one answer. The Valley must stop shipping cull fruit. That is the one and absolute reason for Texas not being sold on Valley fruit. Perhaps the people who have fruit to sell may feel differently, but Texas never will be sold on its own citrus fruit until this sort of thing is stopped. I have travelled over a great portion of this state and in very few cases do I find best fruit on the market. Why? This is due almost entirely to the trucker who comes into the Valley and in the majority of cases buys either culls or orchard run stuff. There are exceptions of course, but not many. Then this trucker or 'peddler' as he was called in the days of the horse and wagon, goes into a town or city in the state, and often out of the state as well, backs up to the curb and peddles his stuff at a price that is heart breaking to the merchant who is trying to sell your good fruit. Consequently the merchant is forced to obtain the same inferior quality of fruit if he expects

to meet the cut-throat competition of the peddler, who in most cases again, pays little or nothing toward the government operation of the cities in which he operates. Too often he does not live in the town in which he disposes of his fruit and the housewife who purchases his stuff finds herself up against it to do anything about it when she discovers the fruit inferior. If her groceryman sells her anything that proves to be unsatisfactory, invariably he will make it good. Not so the trucker. Seldom does this peddler pay any kind of merchants tax, own, or pay insurance on it, pay paving tax, etc. He simply goes in with his fruit, cuts the price and there you are.

"I have frequently sent good fruit to friends out in the state and almost invariably they will ask 'Why can we not obtain such fine fruit in our town?' Recently a speaker at a Rotary Club meeting in Harlingen said 'Give me the fine fruit I get down here, and not the little, inferior and poor grade stuff I get in Houston and I'll be sold on the Valley.'"

This article, while written and printed with a particular view to conditions existing in Texas, might just as truly have been written regarding conditions in Florida. Until we have learned the lesson that every box of cull fruit placed on the market has a direct effect upon the price and reputation of all fruit produced within the state, we must continue to suffer from the consequences of our folly.

A GREAT CITRUS NUMBER

The Mission Times, published at Mission, Texas, in the heart of the grapefruit section of the Lower Rio Grande Valley, recently issued its third annual citrus number. Issued in tabloid form with colored cover, the number comprised 100 pages of most interesting citrus matter and portrayed in glowing terms the wonderful growth of the citrus industry in Texas. Editor Ralph Bray is to be congratulated upon his achievement.

Control of distribution is an important factor in the welfare of the citrus industry, and a consummation devoutly to be desired—but even the most effective control of distribution cannot offset the handicap under which the industry labors by reason of the sale of culls and unfit fruit.

The wise grower will be ever on the alert for new and better methods of grove practice—but he will continue to apply the tried and proved methods until the new methods have been proven to be better.

A citrus tree may respond quickly to a stimulant, but it cannot continue to thrive on stimulants alone—it must have a well balanced diet if it is to give the best results.

Whatever you do to promote better marketing conditions, do not lose sight of the fact that it is the producer of fruit of quality and appearance who makes the most money under any marketing set-up.

CITRUS COMMENTS

—BY—

Charles D. Kime, Orlando, Florida

This department is devoted to furthering horticultural interests of Florida. Letters of inquiry, discussion or criticism will be welcomed

Potash Sources

During the past year the unit price of most fertilizer materials has dropped materially. The materials are nitrogen sources of all kinds and all phosphorus sources, also chemicals that are used in the fruit growing industry. The following information on POTASH its formation and the sources of supply is both timely and interesting.

The term "POTASH SALTS", as used in commerce, comprises a group of compounds having as a base "potash" or potassium oxide. The chemical symbol of the base is K_2O , "K" stands for potassium or KALIUM and "O" for OXYGEN; the figure "2" indicates the molecular proportion in which potassium and oxygen combine. Potassium is a metal. An oxide of a metal is called a "base". Most bases can exist in the free state, for example iron oxide, aluminum oxide, silver oxide, etc. Calcium oxide, magnesium oxide, barium oxide, etc. Iron, aluminum, silver, etc. belong to the heavy metals. Of these calcium, barium, magnesium, etc., are representatives of the group of ALKALINE EARTH metals. There exists besides this a third group of metals, the LIGHT metals, to which potassium, sodium, lithium etc., belong. The OXIDES of these light metals never occur in the free state, but always in combination with other compounds, for instance with water or with an acid. If an oxide of a metal, that is a base, combines with an acid a salt is formed. Examples would be "chloride of potassium" called "sulphate of potash" in commercial circles; silicate of potassium is a water soluble material and is known as "potash water glass". There is also a double compound of silicate of potassium and aluminum which is insoluble in water. This compound is the main constituent of a number of minerals, the principal representative of which is, FELDSPAR OR ORTHOCLAS. This mineral is very widely distributed. In other words, chloride of potassium is formed by the union of potassium oxide (K_2O) and hydro-

chloric acid; sulphate of potassium is the result of the combination of potassium oxide (K_2O) and sulphuric acid; silicate of potassium and aluminum combine as soon as potassium oxide (K_2O) aluminum oxide and silicic acid (silica) are brought together and in the proper proportions. Such conditions occurred in many sections of the United States at the time feldspar and other forms of potash bearing rocks and sands were formed.

Chemically pure potassium chloride contains 63.04% actual potassium oxide (K_2O); and therefore a commercial chloride also called muriate of potash with 50% K_2O is approximately 80% pure, meaning that it contains about 80% chloride of potassium. This is as a rule, the degree of purity of the German commercial muriate of potash employed largely for agricultural purposes.

Commercial Muriate of Potash

Up to over a century ago potash salts were of greater importance for the chemical industry than the corresponding soda compounds, because potash was more readily extracted from the ash of plants growing on land than the soda, which was obtained from the ash of sea-plants. After the invention of Leblanc's soda process, however, soda salts could be manufactured very cheaply and therefore took the place of nearly all potash salts, excepting potash salt-peter. When, however, a few decades later the famous German chemist Justus von Liebig through his classic researches established beyond a doubt the important role which potassium plays in the nutrition of plants, the interest in potash was revived, causing scientists all over Europe to devote their energies towards finding methods for obtaining potash as plant food from various raw materials. A few years later all these efforts received a serious check with the discovery of the Stassfurt potash deposits; but now the industry of potash salts entered into a new era.

The presence of brine and saline

deposits in and near Stassfurt, a small town southwest of Magdeburg, was known already in the 13th Century. A large amount of rock salt was derived from these deposits during the 16th and 17th centuries. In 1857 two new shafts were driven into those deposits by the Prussian government, the von der Heydt and the Manteuffel pits, resulting in the discovery of an enormous rock salt stratum in the upper layers of which ROSE and RAMMELSBERG found a high percentage of potash (K_2O). This stratum extends in a northwesterly direction far into the North German lowlands. Mines have been opened and are being operated at Stassfurt in Prussia, Vienenburg and Thiede in Brunswick, at Jessenitz in Mecklenburg, and a number of other places. The minimum depth of the stratum is 1000 meters (about 1150 yards). Often mineral oil is found together with the rock salt. The deposits, of course, have been formed by the evaporation of sea water. The ocean represents an aqueous solution of easily soluble salts, the concentration of which is gradually increasing. Among these salts SODIUM chloride takes the first place; next come magnesium chloride, magnesium and calcium sulphate, POTASSIUM CHLORIDE, sodium and magnesium bromide, and calcium chloride. The Atlantic ocean contains to-day 3.62% of total solids, of which 2.80% is sodium chloride and 0.14% potassium chloride. The water of the Dead Sea in Palestine shows at present 8.15% sodium chloride and 1.10% potassium chloride. Its total solids amount to 22.30%. If the straits of Babel-Mandeb were closed to-day, the Red Sea with 4.20% solids and a depth of 240 meters would dry out in exactly 100 years AND THE THICKNESS OF THE SALT STRATUM WOULD BE 4 METERS.

It follows that on drying out even the deepest ocean could not leave a salt deposit of 1000 meters' thickness, like that at Stassfurt. The soluble salts were gradually eliminated by Crystallization; but during the

process of evaporation a continual yearly influx of water must have taken place through shallow straits, just as can be observed to-day at the Eastern bight of the Caspian Sea, Kara Boghaz. As a matter of fact the Stassfurt salts possess thin leadings of Anhydride between layers of Rock Salt of 8-9 meters' thickness, representing distinct annual rings which prove a yearly alternate crystallization of rock salt in summer and of sulphate of lime (Anhydride) during the increased water supply in winter, during a period of 10,000 years. Some scientists claim the formation of those deposits required a period of 15,000 years.

After the closing up of the straits a further evaporation to dryness took place; then there were separated above the rock salt and mixed with it:

First: Polyhalite, which is a sulphate of lime, potash and magnesia.

Then: Kieserite, or sulphate of magnesia.

Finally as the topmost layer: Carnallit, which is a double chloride of magnesia and potash.

The layer of Carnallit has a thickness of 25-40 meters and forms the raw material for the enormous Stassfurt potash salt industry. The whole deposit is covered by protecting stratum of saliferous clay, then by Anhydride and colored clay slate, and is raised in the center longitudinally from southeast to northwest, so that the starta near Bernburg and Aschersleben are still nearly horizontal, while towards northwest they gradually fall off steeper and steeper on both sides.

Later on were formed by partial lixiviation the deposit of younger and purer rock salt, of limited extension, and presumably also KAINIT and EYLVINIT. Kainit contains magnesium chloride and POTASSIUM sulphate, while Sylvinit consists mainly of a mixture of POTASSIUM chloride and rock salt. A bed of Kainit of extraordinary magnitude lies over the Carnallit in the Anhaltian part of the salt deposits.

At first the upper potash-carrying layers of the Stassfurt salt deposits were thrown away as useless salts (therefore the term "Abraumsalze". "Abraum" means rubbish), but later on in 1861 FRANK, and in 1864 FORSTER and GRUENEBERG developed methods for the manufacture of POTASSIUM CHLORIDE from these abraum salts.

Since 1879 the mining of the "Abraumsalze" is subjected to certain regulations. The sale of all products made therefrom is also fixed by

agreements, affecting POTASSIUM CHLORIDE, potassium sulphate, potassium and magnesium sulphate (double manure sale), Kieserit, sulphate of soda, bromine and magnesium chloride. The mines located at Stassfurt, Leopoldshall, Aschersleben, Westeregeln, Neu-Stassfurt, Vienenburg, Bernburg, Thiede, Wilhelmshall, Pessenitz, etc. are all under the government control.

Carnallit and Kainit are the most important of the Stassfurt "Abraum" Salts, the former being used exclusively in the manufacture of high-grade Muriate of Potash with from 80—96% potassium chloride while the latter is the raw material for the production of potassium sulphate and potassium salts are valuable fertilizers. Germany employs principally the crude salts as mined, while all other countries prefer the manufactured pure potassium chloride or sulphate, because of the cheaper freight rates on the concentrated salts.

The crude Carnallit forms white or reddish crystalline masses colored by iron oxide, which are highly deliquescent. It can be crystallized unchanged from a saturated solution of magnesium chloride, that is one containing at least 25% of magnesium chloride. Water decomposes it to readily soluble magnesium chloride and less readily soluble magnesium chloride and less readily soluble potassium chloride; the latter crystallizing out freely from hot saturated solution in contra-distinction to sodium chloride.

As it comes from the mine the crude Carnallit consists in average of:

55—65% Carnallit
25—20% Rock Salt
20—15% Kieserit

4—2% Magnesium chloride and Tachhydride, with small quantities of insoluble Anhydride, Boracit, Marl, Micaceous iron ore, Clay, etc.

It carries from 15—16% potassium chloride, corresponding to 9.5—10.1% K₂O.

Two processes are in practical use at Stassfurt. They are both founded upon:

1. The greater readiness with which Carnallit dissolves in water than Rock Salt or Kieserit.

2. The decomposition of Carnallit by water, whereby potassium chloride is separated and magnesium chloride rendered soluble;

3. The solubility of Carnallit in an excess of a solution of magnesium chloride, or the formation of Carnallit from potassium chloride in the presence of a large excess of magnesium chloride, and the very slight solubility of magnesium sulphate and sodium chloride in liquor containing

much magnesium chloride.

4. The greater solubility of sodium chloride in cold water as compared with that of potassium chloride.

According to one method the crude Carnallit is extracted with a hot concentrate solution of magnesium chloride, which dissolves principally Carnallit, the latter crystallizing out on cooling. The pure Carnallit is then treated with water alone, and the POTASSIUM CHLORIDE is separated from the chloride of magnesia by crystallization.

The other method, generally in use at present, calls for an extraction of the crude Carnallit with a 25%-magnesium chloride liquor. Potassium chloride separates then directly upon cooling.

Both processes are complicated. There is a loss of from 15—25% of potassium chloride. From the mother liquors an artificial Carnallit is manufactured. The end liquors are worked for bromine.

Influence of the Discovery of the German Potash Deposits Upon Industry in General

The first Stassfurt Potassium Chloride was brought on the market in 1861, and replaced first the chloride of potash made from kelp. The manufacture of the latter was kept up by considerably increased selling prices of Iodine. Experiments conducted with a view to obtain chloride of potash from the ocean were discontinued; so were all attempts to devise methods for the extraction of potash from feldspar. The Indian potash saltpeter was almost entirely eliminated from European markets, since it could not compete with the artificial potash saltpeter made from Chili saltpeter and Stassfurt potassium chloride by double decomposition.

Treated according to Leblanc's soda process potassium chloride can easily be changed to potassium carbonate. This artificial Carbonate of potash has, however, not yet succeeded in replacing entirely the natural carbonate made from the ash of plants, the ignition residue from beet-root molasses and the potash obtained from the sweat of sheep's wool. The consumption of carbonate of potash increases daily. Potash soaps and potash glass are again valued. Potassium carbonate made from muriate of potash forms the raw material for a large number of technically important potash salts. The principal importance of all potash salts lies, however, in their extraordinary value as artificial fertilizers. As Liebig pointed out the plant needs potash as an

absolutely necessary and essential food stuff. The fertilization with potash salts has proved of great advantage in most of the civilized countries, not only for COTTON, TOBACCO, POTATOES, but also for GRAIN, CORN and GRASSES and FRUITS. The consumption of potash salts in this country during the last ten years before the war reached enormous proportions. Here most of the potash is used in the fertilizer industry and practically all of the potash salts necessary are imported from France and Germany which exercises a monopoly fixing outputs, prices, etc. Competition has so far been out of the question, and will be, until cheap process is devised for the commercial exploitation of the vast stores of insoluble potash locked up in feldspars and similar silicates. This can best be accomplished by means of a proper by-product which must have a considerable value itself and in this way indirectly pay for the cost of extraction.

Future Potash Production

There exists to-day in the United States and Canada several rather unimportant sources of soluble potash salts and potash manufacturing establishments. The disappearance of our forests has greatly curtailed the production of potash from the ashes of wood. In Canada the alkali carbonate of potash has been manufactured extensively, since that Country abounds in forests. However, during the last fifty years a great falling off in the manufacture of the so-called "pearlash" has taken place. Deposits of potash salts, on a diminutive scale, are said to have been located in California on Government land. The necessary legislation is pending to allow proceeding with the exploitation of these deposits. A small amount of potassium chloride is obtained from sea-weed or kelp, on the Pacific Coast. Cost of production must be extremely high, and can be offset only by by-products like Iodine, etc. Several saline deposits in the region of Great Salt Lake, Owens Lake and Searles Lake basins are being investigated for potash production on a commercial scale. So are the so-called Nebraska Potash Lakes. An extensive Alunite deposit (impure basic potash alum) has been experimentally worked by a company with large capital. A short time ago in the eastern part of California were found small deposits of potash, alum and sulphur. It is said that company was formed to develop that tract of land. And so it goes on. The search for potash deposits continues in the west, and some day may be crowned by

success, after millions of dollars have been spent in borings. In the meantime even the smallest quantity of potash salts produced in this country will act as a stimulus to American production.

A comparatively small amount of soluble potash salts is collected from the flue-dust of cement plants and blast furnaces. The machinery required is very expensive, calling for the installation of a "Cottrell" precipitator; this apparatus produces an electro-static field which the flue-dust traverses, the potash being precipitated on one of the poles. The precipitator is very efficient, but costs in the neighborhood of one hundred thousand dollars to install. Operating costs are high, but at present prices no doubt the investment will pay for itself. The Cottrell apparatus is in successful operation at Riverside, California, and at a cement plant located at Hagerstown, Maryland. It will probably be installed at a number of other cement plants.

Soundings in search of potash salts have been conducted in the province of Belfort, France, but so far no results have been attained. Potash has been discovered in the thick layers of ashes covering the ruins of Herculaneum and Pompeii, and the conclusion was drawn that the neighborhood around Vesuvius is rich in potash deposits appearing there as a by-product of the Galician salt industry but it is somewhat premature to consider them as a possible competitor of the Stassfurt mines. Of more importance in that respect are the discoveries of deposits of chloride and sulphate of potash in Catalonia in Spain, but naturally their true value can only be estimated after a thorough practical investigation.

Both in this country and in Europe small amounts of potassium chloride and sulphate, respectively, are also derived from waste liquors of certain chemical plants and from seawater. The amount is very insignificant, and is mentioned here only as a matter of record.

On looking over the situation—as described above—we would have to admit that, although some potash is actually being produced in this country and elsewhere outside of the product of the Stassfurt mines, the amounts produced are small and probably always will be, considering the nature of the raw materials employed and their comparatively limited supply, so that at present all these various projects of obtaining potash and the numerous small enterprises actually producing potash from insignificant sources of raw materials can

hardly ever be of any importance when compared with the enormous and much less costly production of the German mines and the rate at which especially the United States consumes these potash salts. Very often, in spite of the gigantic German output, the demand in the U. S. for potash salts for agricultural purposes surpasses the supply, and therefore the German syndicate manifests no nervousness whatever in the presence of attempted competition, especially the competition arising during war time, and is consequently enabled to continue dictating prices to the rest of the world.

American farmers have asked themselves often enough: "What will we do, if the supply of potash salts, so essential to our prosperity and therefore to the prosperity of our Country, is ever shut off, by a war, for instance"? This condition exists now, and the United States must pay exorbitant prices for a material which is needed so badly for her own commercial development. BUT RELIEF IS IN SIGHT. The natural resources of this country are wonderful. Of course it is necessary to know how to use them to best advantage. The United States abounds in feldspar and feldspathic rocks, and these minerals are widely distributed throughout the country. The State of Connecticut ranks FIRST in the list of feldspar producing states; Pennsylvania is second, then come Maine, New York, Maryland, Massachusetts, Wisconsin, Virginia, Texas, North Carolina, Georgia, Minnesota, etc. These rocks have among other constituents a considerable percentage of potash; they are therefore a source of raw material from which potash can be extracted, and after such a method has been devised which will produce potash from these rocks in commercial quantities and at an operating cost low enough to compete with foreign products, then these feldspathic rocks will form the MAIN source of potash in this country.

Liebig stated that in order to benefit the plants the potash must be applied in water soluble form. The question arose: "Has perhaps FINELY POWDERED feldspar any value as a potash fertilizer"? The answer is negative. Numerous experiments were conducted by scientists all over the world, from the middle of the last century until this day, to test the availability of finely pulverized feldspathic rock and to ascertain whether it would serve as plant food and potash-conveyor. The experi-

(Concluded on next page.)

IMPRESSIONS

By the Impressionist

Wonder how many of our Florida cross-state canal enthusiasts ever paused to reflect that a real successful thing of the sort cannot result other than in opening territory along the eastern seaboard to the active competition of Texas citrus products?

The State Plant Board having lifted the ban against importation into Florida of California citrus, long barred because of brown-rot, opens the way for the year round sale of California lemons here, and for summer shipments into Florida of California Valencia oranges.

To date California continues its embargo against the admission of Florida citrus into California, the embargo officially being stated to guard against the introduction into California of citrus canker and melonose.

Ripley, isn't writing this, but, believe it or not, Florida's sales of grapefruit in all markets on March 29 averaged precisely the same price as on the corresponding day last year. Florida oranges on that day averaged 25 cents per box higher than a year ago. California's orange averages that day were precisely the same as in the year previous.

By the bye, it was a surprise to us to learn recently that the California Fruit Growers Exchange does not participate in either of the two long established California orange shows, or in shows of any nature for that matter. After all these years of existence it seems the California Exchange still has its first show to participate in. Sunkist gets into one or another of such exhibitions only through the voluntary participation of local organizations of the Exchange.

We are writing these lines on the anniversary date of Tampa's most momentous occurrence, when great Sulphur Springs on the north of town ran dry. According to the Tampa Tribune of that morning the water suddenly ceased flowing at its normal of many thousands of gallons per

minute, and with a great gurgle flowed backward into the ground, leaving immense caverns exposed to sight. Hundreds, maybe thousands, of automobiles headed that way all day in an unending stream, but none paused to explore the alleged caverns.

A few years later hundreds of automobilists on the first day of April headed for the mouth of the Alafia river to see the big ship LOOFLIRPA which had "gone aground on that rock bound coast". The old Florida Grower pulled that one, its weekly issue happening to be scheduled for that date.

But Tampa's prize April Fool joke was pulled on March 30 of this year. We can't help but wonder what the two thugs on whom it was pulled are thinking even now. On that evening these two, apparently professional sluggers, went out to the Bayshore residence of Parentheses Joe Lyons with the evident purpose of "putting the bee" upon the said C. W. Lyons as a warning to him and sundry other Tampa citizens interested in better government not to take a too active interest in the sheriff's race there.

They opened the meeting with pleasant words, then they both hit the Lyons person so hard he bounced. He bounced right back in their direction, and when a 250 pound guy gets started bouncing he is hard to stop, particularly so if he really enjoys bouncing. After a few minutes of this amusement the two apparently concluded they weren't getting the fun out of it which they anticipated, and departed hastily. It would be interesting to know what sort of report they rendered upon returning to their principal or principals.

Whatever the real underlying reason, there is no use trying to blame it on the weather, but Florida citrus growers simply are not coming out to attend meetings recently. The Clearing House meetings were very poorly attended. The regional meetings to select members of the Committee of Fifty in many instances didn't have a corporal's guard in attendance; and

scheduled meetings of some Exchange associations about the same time just about broke all records for non-attendance. We do not know, and won't undertake to guess, the whyfore; but simply note the fact as interesting.

Dairymen in Florida generally are boosting strongly for Pasteurized milk; and the sale of Pasteurized milk is increasing considerably. The representation is vociferously made that "nothing is taken away," by the Pasteurizing process. Yet it is now regarded in medical and scientific circles as definitely demonstrated that Pasteurization immediately and

(Continued on page 20)

CITRUS COMMENTS

(Continued from preceding page)

ments made by the U. S. Agricultural Department proved fertilization with ground rock alone a failure. Detailed experiments performed by the celebrated German Chemist Dr. Maercker showed also conclusively that ground feldspar and feldspathic rocks were absolutely useless as fertilizers. While a slight percentage of their potash contents is ultimately rendered available to plant life by the action of nitric acid, ammonium bi-carbonate and the acids of the soil the process is entirely too slow to benefit a given crop.

Methods for extracting potash from feldspar were suggested over seventy years ago by German, English and French chemists whose experiments were abandoned in undeveloped stages at the time of the Stassfurt discoveries. However later, after the formation of the German Potash Monopoly, interest in the problem of procuring potash from feldspar has been re-awakened, as is proved by the great number of patented processes for the utilization of potash-carrying feldspathic rocks. Most of these methods are of little or no commercial importance. Some of them may show promising results on the laboratory scale, but until the dissociation of potash feldspar can be successfully applied on a COMMERCIAL scale we have very slight prospects of freeing ourselves from the absolute dependence on imports.

BLUE GOOSE NEWS

Monthly News of American Fruit Growers Inc.



Edited by The Growers Service Department

MARKET IS STRONGER PROSPECTS ARE GOOD

Florida Valencias began to come into their own in March, and now promise to hold the market preference until shipping closes. The satisfactory prices realized might have been still better, but for the fact that with the Florida product commanding an average of as much as seventy cents per box more than California's offerings some of the smaller markets turned to Californias because of the difference in price.

As of April 1 California was reported to have 7,000 cars of navels and miscellaneous oranges remaining. Other estimates were that of this there was about 5,000 cars of shippable fruit. Tulare county Valencias began moving early from northern California, with about 2,500 cars reported. They have been running heavily to 250s and smaller, and have mostly been taken by western markets. Southern California Valencias will follow shortly, the California crop running about thirty days early in maturity. These also are reported running heavy to small sizes. Florida Valencias are in strong position, and likely to remain there until the close of shipping.

Florida grapefruit also has now moved into a controlling position. Only 40,000 boxes of Porto Rico grapefruit are reported available for shipment before July 1. The shortage is due to late bloom in certain districts there due to dry weather.

The small supply of Florida grapefruit now remaining should be taken readily by the markets at satisfactory prices, regardless of such offerings of strawberries and other things which may compete. We look for Florida grapefruit to do well for the balance of the season.

The only bar to high prices for both Florida Valencias and Florida grapefruit is the fact that these Florida products now are the highest priced articles on the foodstuffs markets, and by comparison already look to be expensive to thrifty and careful consumers.

FREIGHT COSTS REDUCED ON EXPORT GRAPEFRUIT

A differential, or further reduction below the new and lower level of freight rates, on citrus fruits for export has now been granted by rail carriers. Fruit for export therefore will be charged five cents per box less than the prevailing rate to New York. Transatlantic steamship companies have given an additional reduction of ten cents per box, so that the combined reduction amounts to fifteen cents per box when via New York.

This matter was initiated by W. H. Baggs, general manager of the American Fruit Growers Inc. last winter when in company with R. B. Woolfolk he attended the conference called at Jacksonville by the rail lines, which resulted in the general reduction in citrus rates to eastern territory. It was later followed up by J. S. Crutchfield, president of the American Fruit Growers Inc. and negotiations practically completed, when they were then ratified by all Florida fruit shipping concerns acting in concert.

TERRA CEIA GROVES RECOVER FROM STORM

The heavy March blow and its accompanying high tide were the cause of great anxiety to many citrus growers upon Terra Ceia Island, adjoining the upper portion of Manatee County above Palmetto.

The heavy and continuing West wind piled the waters of the Gulf into Tampa Bay, with the result that the level of the bay rose sharply and a new high-tide record was created. At Terra Ceia the water was higher than ever has been known since the island was settled.

The island is one of the beauty spots of Manatee County; and is intensively planted in citrus groves. It has for years been known for its production of exceptionally early grapefruit, part of which is handled by the Palmetto packing house of the American Fruit Growers Inc.

During this March storm some acreage was inundated for a short

OUTLOOK FOR CITRUS FRUIT WORLD PRODUCTION

The California production of navel and other winter oranges, having increased by some four millions of boxes in yearly yield since 1922, has about reached its peak, in the opinion of the California Extension Service experts. Less than three per cent of the California navel and winter orange acreage is now non-bearing, they say in a recent circular upon the agricultural outlook. Presumably deterioration in some older acreage and the more or less constant sub-division of acreage in the vicinity of growing communities should hold production at about present average figures, in the absence of some unusual stimulus to new plantings. The plantings of navel and other winter oranges in California within a period of recent years have been extremely light.

Florida is credited with an average annual increase in winter orange production of four per cent during the past few years; and this ratio of annual increase these authorities expect to continue over the next several years. Florida winter orange acreage is estimated as about twenty per cent in full bearing, sixty per cent under fifteen years old, and approximately twenty per cent five years old or less.

Texas is cited as now having something more than 21,000 acres of oranges, only thirty per cent of which is in bearing, and practically none of which as yet has come into full bearing.

Arizona is credited with 7,200 acres planted to oranges, of which about thirty per cent has reached bearing age.

The export market for winter oranges during recent years has absorbed slightly more than seven per cent of the U. S. production. Of this

(Continued on page 2)

time, and the trees shed their leaves, but later news from Ervin Springstead representing the AFG organization at Palmetto indicates that the trees are going to be able to throw off the shock and make a come-back.

Adv.

BLUE GOOSE NEWS

OF INTEREST to the citrus growers of Florida, each month, contained in four pages of paid advertising from the

AMERICAN FRUIT GROWERS INC.

Florida Division

Sixth Floor, State Bank Bldg.

ORLANDO, FLORIDA



WARRANTED OPTIMISM

The outturn of events has shown the substantial foundation upon which was based the optimistic views concerning Florida citrus fruits contained in the columns of the Blue Goose News during preceding months.

Some of these optimistic expressions were made at a time when current happenings were such as to be extremely discouraging to almost the entire industry. If some persons mistook them for simply empty words aimed to bolster the courage of all concerned, they hardly can be blamed for that.

But they were not.

At all times this organization intends to deal with, and to disseminate, facts only.

Anticipatory utterances and views concerning future events invariably are toned down to a basis of conservatism and restraint.

If then the American Fruit Growers Inc. through statements in these columns, or elsewhere voiced by R. B. Woolfolk or C. N. Williams speaking for this Division, breathed optimism at a time when well founded optimism was extremely noticeable by reason of its absence in other quarters, it was solely because the widespread operations of this organization put its spokesmen in the possession of authentic information which others were lacking.

It is a complex day and age. Hundreds of distant factors influence or control the turn of events at close hand. Information in order to be accurate must be complete.

There are many advantages ac-

cruing to this organization by reason of its nationwide scope and the international field of its operations, but nowhere is advantage more manifest than in the complete and accurate information with respect to production, markets and consumption which is daily available for the guidance of those who direct it.

OUTLOOK FOR CITRUS FRUIT WORLD PRODUCTION (Continued from page 1)

85 per cent went to Canada.

In Valencias and summer oranges the California production has doubled in ten years, according to these same California authorities, rising from seven millions of boxes in 1921 to fourteen millions of boxes in 1931. Californians term the citrus summer as the six months from May to October inclusive, and production shipped during these months is designated as "summer oranges".

The authors of this California circular anticipate possible reduction in the U. S. exports of summer oranges, more than fourteen per cent of which were exported in recent years, due to increased Canadian tariff duties and constantly expanding exports from the Union of South Africa, Brazil, Australia and other sources.

In grapefruit Florida is credited with an annual average increase in yield of approximately five per cent during the past few years, and the further increase is estimated as due to continue at about that figure for several years to come.

Florida is credited with 93,000 acres planted to grapefruit, of which one-third is fifteen years old or older.

The total grapefruit acreage in Texas is estimated at 70,000 acres, with twenty per cent being five years old or older, and practically none yet come into full bearing. Production in Texas within ten years is cited as having increased from 4,000 boxes to over nine hundred thousand boxes.

The total acreage planted to grapefruit in Arizona is given as 12,600 acres, and just about one-third has come into bearing.

Porto Rico, the Isle of Pines, Jamaica are credited with increases due in winter grapefruit production, while South Africa, Brazil and Argentina are expected through their increasing summer grapefruit production to add considerably to the world production total.

The plantings of grapefruit in California in the Imperial and Coachella valleys, which are shipped during the time Florida grapefruit is going forward, are believed due to increased

production there to some slight extent, but no figures concerning acreage or production are given. Most of the acreage of summer grapefruit in California is said to be in full bearing, with only small plantings during recent years.

While the national and world demand for winter grapefruit has increased tremendously during the past few years, the demand for summer grapefruit is said to have increased even faster.

ORANGE-SEMINOLE IS HAVING SPOTTY BLOOM

Paul Rogers, manager of the Maitland packing house of the American Fruit Growers Inc. says that despite the spotty and uncertain nature of the bloom in that section to the time this is written the indication warranted belief in a fairly good crop for the next season.

Valencia bloom has been fairly good. On pineapple oranges it has not been so good. Seedling oranges, of which there are many in this section, have been very slow, but indications are for a substantial April bloom, a large part of which is coming on the older wood, and not upon the new growth recently made. Grapefruit bloom has been very spotty, with indications that there will be considerable variation in the maturity of the fruit next Fall.

Prices recently upon both Marsh Seedless grapefruit and Valencias have been quite satisfactory; and the Maitland house still has considerable fruit to move.

LOOKS LIKE NEXT CROP BE SHORT IN PINELLAS

Operations in Pinellas County for the present season will just about be over by the time this appears in print. There was practically no grapefruit left on the first of the month, and the county's Valencia crop at that time was at least half gone.

The prices realized on Marsh Seedless grapefruit and on Valencias generally proved quite satisfactory to the growers; and aided much in creating a feeling of optimism as the season came toward its close. The Valencias, however, ran strongly to large sizes, and failed to obtain the high prices which some had earlier anticipated.

Rainfall in Pinellas County has been considerably in arrears, and, according to J. W. Parker, manager of the packing house of the American Fruit Growers Inc. at Walsingham, near Largo, unless the deficiency is made up the volume of next season's citrus crop there will be materially

"The time has come for a combination, on a non-partisan basis, of wage earners and business men for their mutual protection. They need to be organized, alert and vocal. Then the Congress and other bodies will listen because they will feel they have some support in resisting further expenditures, and some encouragement in pursuing a policy of retrenchment."

Calvin Coolidge.

affected. Bloom had been very slow to the first of the month, with practically no bloom on grapefruit up to then.

ARKANSAS CONCERN IS OUT OF PRODUCE FIELD

There should be no confusion because of the similarity of names of the American Fruit Growers Inc. and The American Company operating in Arkansas. The latter which is a wholesale grocery concern recently withdrew entirely from the produce business in that state. The Arkansas operations of the American Fruit Growers Inc. continue as heretofore, but upon an enlarged basis. Recently the Union County Truck Growers Assn. with headquarters at El Dorado, Arkansas, elected to market its tomatoes and Spring vegetables through the American Fruit Growers Inc. and thus becomes the latest addition to the ranks of Arkansas growers using AFG marketing service.

SEASON NEARLY CLOSED FOR PASCO COUNTY FRUIT

Both grapefruit and Valencia oranges were cleaning up fast at last report from R. J. Flynn, manager of

Odessa Lake Region Growers Inc. at Odessa in Pasco county.

The packing house of Odessa Lake Region Growers Inc. serves growers in that section of Pasco County, and the adjacent sections of Pinellas and Hillsborough counties; and at the time of that writing it was believed that operations would be nearing their finish for the season by the fifteenth of April.

Continuing dry weather was blamed for the very late bloom in most groves in the vicinity; but about the first of the month the trees were shooting out and showing buds, so that bloom was in early anticipation.

PROSPECT GRAPEFRUIT HAVE SEVERAL BLOOMS

From Fort Pierce, T. S. Kirby, manager for the American Fruit Growers Inc. at that point, reports there has been a good bloom on Valencias, and a fair bloom on pineapple oranges. Grapefruit bloom up to the first of the month had been very slow, with a prospect for the grapefruit trees to show several blooms.

They had been having good growing weather with plenty of showers;

and citrus groves generally were reported as being in wonderfully good condition.

Not much fruit was left in the Fort Pierce section, even at the first of the month most of the grapefruit had been moved and a good percentage of the Valencias also had been shipped.

BLOOM IRREGULAR IN LEESBURG SECTION

Fruit shipping in the Leesburg section of Lake County practically was wound up by the first of the month, according to A. R. Sandlin, manager of Lake County Growers Inc. at that point. Only a scattering of Marsh Seedless grapefruit and Valencia oranges remaining to move.

Valencias generally had been picking out short of the estimated yields. This generally was due to small sizes, but the sparseness of the foliage which made the fruit so easily visible to the estimators also was thought to have been responsible in part for the discrepancies between estimates and the actual amount of fruit.

Due to the long continued drouth, bloom was reported as very spotted and irregular; but the outlook for April bloom was believed to be good.

Adv.

Plus-

The furthest flung, most aggressive, selling force.

A greater number of sales outlets than is possessed by any other organization engaged in selling fresh fruits and vegetables.

An experienced, intelligent, direction throughout.

The famous Blue Goose trademark, ever more widely distinguished as an index of value.

An appreciated superior service to producers, the trade, and consumers alike.

Plus that vital something which spells the difference between success and mediocrity.

American Fruit Growers Inc.

Florida Division
Orlando, Florida



Now USE GENUINE PERUVIAN GUANO AT NEW LOW PRICES

for the SUMMER APPLICATION

NOT IN YEARS... perhaps never before... has there been a greater need for organic fertilizers for the Summer Application to citrus trees.

Now, this summer, you can have the undisputed excellence of Genuine Peruvian Guano to give your groves a square meal of the organic nitrogen they need and at a price every grower can afford... *the lowest in years!*

At today's low prices, and with ample supplies of Genuine Peruvian Guano on hand; you are now offered the privilege of specifying just what percentage of Nitrogen (up to the full Ammonia content of the analysis) you want to be derived from Genuine Peruvian Guano in any of the regular NACO Brand Citrus Fertilizers... *and at no extra cost!*

Why Genuine Peruvian Guano for the Summer Application?

IT'S A NATURAL ORGANIC. Genuine Peruvian Guano is nothing more or less than digested fish... the droppings of the millions of fish-eating birds that live on the Bird Islands of Peru. Not only is this material a complete fertilizer in itself, but it contains many of the rarer elements that science says are of great benefit to plant life.

IT'S LONG LASTING yet the most available of all natural organics. Nature demands that plant food shall be furnished as needed for maximum production of the crops under cultivation. Genuine Peruvian Guano has this unusual quality of gradual release of its plant food... some almost immediately, for quick growth; some slowly, for continued development and vigor.

Thus in Using Genuine Peruvian Guano for the Summer Application You Are Gaining Prompt Growth; Slow, Steady, Complete Feeding During the Hot Months, and a Soil Conditioning Effect of Permanent Value

IT ADDS BENEFICIAL BACTERIA — SOIL WORKMEN. Decomposition of organic matter is caused by bacterial action in the soil. When bacteria are not present in sufficient number to carry on this process of Nature, plant life suffers.

Genuine Peruvian Guano contains its own abundant supply of bacteria which releases not only the nourishment in the Guano itself, but liberates such plant food as may already be present in the soil.

PERUVIANITE. In the 15 different analyses of the Genuine PERUVIANITE Formula, Genuine Peruvian Guano is the source of one-half of the Ammonia of these high analysis mixtures.



You who use PERUVIANITE are offered the same privilege as users of the regular NACO Brands. Specify the percentage of Nitrogen you want to be derived from Genuine Peruvian Guano (up to the full Ammonia content of the analysis) and you will receive a special mixture, duplicating the high analysis PERUVIANITE Formula you have been using and containing the specified percentage of Nitrogen from Genuine Peruvian Guano... *at no extra cost!*

YOUR NOSE KNOWS GUANO. You cannot mistake the presence of Genuine Peruvian Guano in any fertilizer. Its odor is as distinctive as the results it produces in your grove. All NACO Brands and PERUVIANITE Formulas have the characteristic odor of Genuine Peruvian Guano.

"NATURE'S WINGED FERTILIZER FACTORY"
Send for this illustrated folder which tells the amazing story of the Guano Birds of the Bird Islands of Peru.
Sign and mail the coupon today!

NITRATE AGENCIES COMPANY, Post Office Box No. 1114, Jacksonville, Florida.		<i>Free</i>
Please send me the folder: "NATURE'S WINGED FERTILIZER FACTORY."		
Name _____	(PLEASE PRINT YOUR NAME)	
Address _____		
City _____		
County _____	State _____	

NITRATE AGENCIES COMPANY
1401-1407 LYNCH BUILDING
JACKSONVILLE - FLORIDA



IMPRESSIONS

(Continued from page 14)

wholly removes all Vitamin "C" from milk, for which reason it should never be given to infants or small children except when accompanied by orange juice, or its equivalent, in order to supply the vitally necessary Vitamin "C". Our dietary experts at Gainesville and Tallahassee know these facts, and for the benefit of the infant population, might well enough stress them to the public.

The well known bag worm recently gave attention to oranges showing a tendency toward softness, and in some circles produced not a little scare for a short time. That worry was quickly dissipated; but the explanation that there is no new and dangerous pest afield does not explain how so many culls and drops were finding their way to market via the motor-truck route.

Taking advantage of the revised patent laws which now permit patenting agricultural products, A. E. Heninger of McAllen, Texas, has patented a new type grapefruit he discovered and has developed. It is a pink-meat grapefruit without seeds; and the patentee evidently believes it promises much.

We regret to report that more recently we have not made the progress we anticipated in further developing our own personal non-squirt grapefruit; but we are still hopeful.

And now Texas citrus interests are negotiating with the Mexican government in the hope of establishing a zone upon the Mexican bank of the lower Rio Grande into which fruit from the fly-infested sections of Mexico will not be admitted. It is to be hoped they will be somehow successful in ridding themselves of that constant menace of reinfestation.

Out in California they have had a reapportionment of legislative representation so that beginning with the the 1933 legislature the agricultural sections for the first time in many years will have a voice equal to that of the cities.

Due to the relatively slower development of big cities in Florida agricultural representation in the legislative halls has been adequate to date, but there are signs that in the future it may not always be so. Present indications are that citrus interests will be fairly well represented in the next Florida legislature.

Politics are taboo here; but the moot question over Florida as to how many, if any, state employees are to be permitted to sit in the forthcoming legislature seems to transcend politics, as politics generally is understood. The state constitution says: "No person holding a lucrative position through commission or appointment of the United States or of this State is eligible to a seat in the Legislature." Despite this there were nearly twenty such in the 1931 Legislature. Some resigned just before the session opened and were reappointed shortly after it closed; but that is only technically begging the question. It is something that never happened before; and is puzzling. The intent to prohibit state departments being represented through employees in legislature deliberations is evident; and the question now becomes one of the voters interpretation of what is, or is not, good public policy.

We acknowledge receipt to Sol Wittenstein of two fine Shaddock. that is, the fruit not the trees. We anticipate these are in lieu of that lunch.

Shaddock generally are curiosities these days, but prior to the Big Freeze they were quite common, almost every grower's door yard then boasting a Shaddock tree as a prized ornamental.

A meeting of citrus growers and shippers to protest against any more money being made available from any source to be used as loans or advances upon citrus crops, properties or appurtenances, either with or without security, will be held in Winter Haven between two o'clock on the afternoon of March 27. The meeting will be held in the telephone booth in the lobby of the Haven Hotel.

Our personal nomination for chairman is Ike Dixon. Are there any other nominations?

ANNUAL MEETING FLORIDA
STATE HORTICULTURAL
SOCIETY

(Continued from page 5)

Roses," W. L. Floyd, College of Agriculture, Gainesville.

Address—"Feeding Roses," Alfred Bosanquet, Fruitland Park.

Address—"Rose Stocks," John V. Watkins Gainesville.

Address—"Designing the Small Rose Garden," M. J. Daetwyler, Orlando.

Address—"Diseases and Insects of Roses," J. R. Watkins, Gainesville.

Address—"Where to Put Roses," J. Leslie Whipp, Jacksonville.

Address—"Rose Varieties," N. A. Reasoner, Oneco.

Business Session

5:00 P. M.—Dress Parade, University of Florida Cadets—Polo Field
Seventh Annual Florida Rose Show
—Hotel Thomas.

Wednesday, April 20, 8:00 P. M.

Address—"The Agricultural Extension and National Prosperity," C. J. Brand Washington, D. C.

Address—"The Agricultural Work Centered at the University," Wilmon Newell, Gainesville.

Address—"The Agricultural College," W. L. Floyd, Gainesville.

Address—"The Agricultural Experiment Station," H. Harold Hume, Gainesville.

Address—"The Agricultural Experiment Station," H. Harold Hume, Gainesville.

Address—"The Agricultural Extension Division," County Agent Work, A. P. Spencer, Gainesville—Home Demonstration Work, Miss Flavia Gleason, Gainesville.

Address—"The State Plant Board" J. H. Montgomery, Gainesville.

Seventh Annual Rose Show—Hotel Thomas.

Thursday, April 21, 9:30 A. M.

Address—"Economic Factors of Importance in the Citrus Industry With Particular Reference to Cost of Production," Dr. C. V. Noble, Gainesville.

Address—"Traffic Matters of Importance to the Citrus Industry," J.

IRRIGATION

Large stocks Pumps, Pipe and other Material for
Immediate Delivery
66 Years of Service

THE CAMERON & BARKLEY COMPANY
Tampa, Fla.

Curtis Robinson, Orlando.

Address—"Vitamines—What They Are and What They Do," Dr. Ouida Davis Abbott, Gainesville.

Address—"A Resume of the Horticultural Crops of Northwest Florida and Their Culture," C. A. Simpson, Monticello.

Address—"The Culture of Pineapple Oranges on Hammock Lands," E. L. Wartman, Citra.

Address—"The Culture of Pineapple Oranges on the High Pine Lands," F. M. O'Byrne, Lake Wales.

Address—"A New and Important Fungus Disease of Citrus Trees," Dr. A. S. Rhodes, Cocoa.

Thursday, April 21, 2:00 P. M.

Address—"Stem-end Rot Control in Citrus Fruits by Removing Stems," H. E. Stevens, Orlando.

Address—"Five Year's Test of Oil Emulsion on Growth, Yield and Quality of Citrus Fruits," W. W. Yothers, Orlando.

Address—"The Basis of Plant Quarantines," Wilmon Newell, Gainesville.

Address—"Citrus Insect Control," J. R. Watson, Gainesville.

Address—"Controlling Gashoppers and Beetles in the Citrus Grove," W. L. Thompson, Lake Alfred.

Address—"The Latest Concerning Natural Enemies of Citrus Insects," E. W. Berger, Gainesville.

Address—"Economic Factors in Citrus and Insect Disease Control," E. F. DeBusk, Gainesville.

Inspection of Agricultural Experiment Station and College Grounds.

Thursday, April 21, 8:00 P. M.

Address—"Limes, Lemons and Tangelos," C. I. Brooks, Miami.

Address—"Mangos—Varieties and Grove Practises," John Morriss, Fort Myers.

Address—"The Temple Orange and Its Culture," Albert DeVane, Lake Placid.

Address—"Loquats," N. A. Reasner, Oneco.

Address—"The Status of the Home Fruit Garden," J. Lee Smith, Gainesville.

Business Session.

ANNOUNCEMENTS

Places of Meeting

General Section, Florida State Horticultural Society, Auditorium, University of Florida.

Ornamental Section, Florida State Horticultural Society, Peabody Hall, University of Florida.

Florida Rose Society, Peabody Hall University of Florida.

Executive Committee

Horticultural Building, University of Florida, Thursday, April 21, 7:30 P. M.

Nominating Committee

Auditorium, University of Florida, Thursday, April 21, 7:30 P. M.

Selection of Meeting Place Committee
Hotel Thomas, Thursday, April 21, 7:00 P. M.

Invitations for 1933 meeting place should be submitted to this committee.

Registration and Information Desk
Lobby Hotel Thomas, April 19, 20, and 21 from 5:00 P. M. to 8:00 P. M.

University Auditorium—One hour previous to each meeting.

Peabody Hall—One-half hour previous to each meeting. Members of the Florida State Horticultural Society and the Florida Rose Society are requested to register at either place and pay their annual dues, which are \$2.00 in the Florida State Horticultural Society and \$1.00 in the Florida Rose Society.

Headquarters

The headquarters for both Florida State Horticultural Society and the Florida Rose Society will be at the Hotel Thomas in Gainesville. The

rates at the Hotel Thomas for these meetings are:

American Plan, \$4.00 per day.

European Plan \$2.00 per day, single.

European plan \$4.00 per day, double.

Other hotels in the city are the White House, Graham, Commercial and Arlington, all of which are modern and comfortable and have very reasonable rates.

Cadet Parade

On Wednesday afternoon at 5:00 P. M. the Military Department under the Command of Major Van Fleet will put on a dress parade of the University of Florida Cadets in honor of the Society.

This will be staged on the Polo Field. Seats and parking spaces will be reserved for the members of the Society.

Golf and Tennis

Those wishing to play golf or tennis at any time during the meeting will have the facilities of the Gainesville (Continued on page 24)



The Original Hardwood Ash Substitute

Due to the rapidly increasing popularity of this strictly Gulf product, imitations are appearing on the market.

Car-Bo-Ash is a Gulf discovery and represents long and careful experimental work. The formula is known only to this company and is of such a nature that it cannot be "guessed at."

Insist on genuine Car-Bo-Ash. It contains correct proportions of calcium and other valuable elements as well. It is dependable and economical.

THE GULF FERTILIZER CO.

Tampa, Florida

Field Men at

Tampa, Clearwater, Bartow, Wauchula, Bradenton, Orlando, Lake Wales, West Palm Beach, Cocoa and Leesburg

CALCIUM REQUIREMENTS OF CITRUS

(Continued from page 7)

hasten the rate of calcium loss because of the increased production of carbon dioxide, and it is doubtful that the gypsum added in the commercial fertilizers will supply the calcium requirement of such groves. When large amounts of acidifying fertilizers are added this puts a much greater burden on the calcium reserve. The difference between the acid phosphate and the bone plots at Lake Alfred points definitely to the advantages of the carbonate over the sulphate as sources of lime for citrus trees and the men who are at the head of the fertilizer industry are thoroughly awake to the importance of adding calcium carbonate to their mixtures.

The effect of lime on the growth of legumes is also pertinent to this discussion. Many workers have shown that calcium is a limiting factor in the growth of legumes because of its effect on nodulation. The greater growth of legumes on soils containing much available lime should be considered as an important factor in grove management. This starts a cycle in that the heavier cover crops will require additional lime, because of the effect of the additional carbon dioxide on the calcium content of the soil.

The effect of calcium on the availability of phosphorus is well known; when acid soils are neutralized the phosphorus comes into the solution more rapidly so that the reserve phosphorus of old groves with acid soils may be made available by the addition of lime. The neutralization of acid soils also conserves the supply of potash in the soil so that it is not lost out of the zeolite at too rapid a rate.

The injury brought about to citrus by the use of lime can be traced to an injudicious use rather than to the application of lime itself. The kind of lime, the organic content of soil, texture of the soil, the depth to the water table, the degree of soil acidity, in the subsoil as well as in the upper layers, and the age of the trees, are all factors in the safe application of lime. Cultivation practices and rainfall also affect liming results. Floyd did not find damage from lime in groves over ten years old. It is probable that in the older groves it was applied more evenly, and that a larger proportion of such groves was uncultivated.

As liming is a soil amendment, it should always be done as evenly as possible. Uneven applications may mean that certain portions of the

root system may be seriously injured. If cultivation is continued in a grove, lime applications should be much lighter than would be the case if it were discontinued. Heavy deep soils not subject to drouth injury or under irrigation may be limed more heavily than the Norfolk sands. Larger applications may be used where the soil is very acid than where it is nearer the neutral point.

The principal sources of lime for a grove are: ground limestone; ground bone; acid phosphate. About 300 pounds of ground limestone screenings may be used with safety on the older groves in the upland

area, providing it is applied evenly and the acidity of the soil and subsoil is more than pH 5.6. On heavier types of soil 500 to 600 pounds may be used. The same amount of hardwood ashes will be found satisfactory although it will be much more expensive. However, wood ashes are more finely divided and penetrate the soil much more rapidly. Consequently they are more desirable for the first application. The calcium content of wood ashes is about one-third that of limestone and, while they tend to supply the lime requirements of the

(Continued on Page 26)

A DIFFERENT PERSPECTIVE



From a Profitable Point of View

The coming season, more than any in the past, will test every grower's ability to produce crops at a profit—will prove your skill as a grower. Conditions require a different perspective. Today you will have to look at your crops from a profitable point of view.

During such periods growers are asked to experiment or to try something new because it is called "cheap." But most of Florida's successful growers have learned from experience that they cannot skimp on fertilizer. They know that experimenting is expensive and they refuse to try out unproved claims of economy in fertilizer.

Because of the demonstrated value of standard brands of Armour's BIG CROP Fertilizer they are relied upon by thousands of growers throughout Florida. For 36 years Armour's BIG CROP Fertilizers have proved their crop-making ability. Their use offers you a different perspective—a broader horizon. From a profitable point of view, use them for all crops this year.

**ARMOUR'S
BIG CROP
FERTILIZERS**
ARMOUR FERTILIZER WORKS
JACKSONVILLE, FLORIDA



Our field representatives will gladly make recommendations that will suit your requirements.

A fertilizer dealer speaks his mind

WHAT could be more opportune right now than the letter below from a fertilizer dealer? Citrus growers are getting ready for the important summer application. Other farmers are deciding what fertilizer to use.

From month to month we have published letters from growers telling what "the fertilizer with the extra plant foods" has meant to them.

But after all, who knows better than a dealer what a fertilizer can do? He sees its effects on not one, but *many* groves and farms. He gets the complaints as well as the bouquets. Here then is a letter from a well-known dealer—THE DEERFIELD FERTILIZER CO. of DEERFIELD, FLA.:

Deerfield, Fla., March 4, 1932

Gentlemen:

When your salesman induced us to begin handling "Agrico" four years ago we doubted if we would be able to sell it as we had built up a demand for a cheaper grade of fertilizer. The first year our sales were fair, next year sales

picked up, the following year our sales trebled the two former years, and this year even under the most adverse farming conditions we expect our "Agrico" sales to surpass sales of former years.

We have checked up to find out why the increased sales in "Agrico" over other brands, and by inspecting crops and questioning growers have found that last year when there was excess moisture crops grown with "Agrico" were of better quality, larger yields, the plants looked healthier and produced longer than crops on which other brands of fertilizer were used. We have noticed this year that during the continued drought the outstanding feature where "Agrico" was used there was no evidence of Dieback and the best producing crops were those crops on which "Agrico" was used.

One reason why we like to sell "Agrico" is we have never had a complaint from any user since we have been selling it.

Very truly yours,

G. A. STEVENSON

If you have already decided on what fertilizer you are going to use this season, we don't ask you to change your mind, we only ask you in all fairness to your crop, to try Agrico and compare the difference in results.

On citrus it may take a little longer to see the difference than on truck crops, but what Agrico did for Mr. Stevenson's customers it can do for you.

For Agrico is no new, untried fertilizer. It contains everything that made the Bradley and Bowker Brands famous, and in addition it contains extra plant foods that mean bigger yields, better quality, and more profitable crops.

The AMERICAN AGRICULTURAL
CHEMICAL CO.

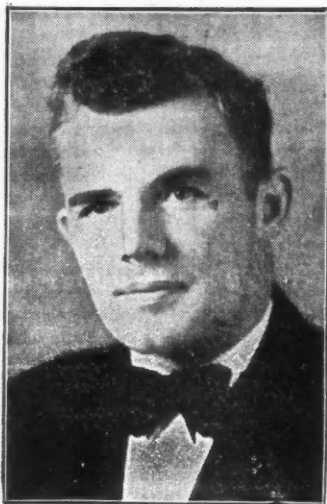
Makers of

BRADLEY'S, BOWKER'S and AGRICO Fertilizers
PIERCE, FLA.



The fertilizer with the EXTRA plant foods

NORMAN H. VISSERING RUNS FOR LEGISLATURE



Norman H. Vissering, of Babson Park, who has distinguished himself as chairman of the Committee of Fifty, is running for the office of representative in the state legislature in Polk county.

Mr. Vissering, while still a young man is the owner of important citrus properties in Polk county and his work in the industry has already made him a figure of importance in the industry.

There are already a few men in the State legislature of outstanding character whose personal interests are allied with Florida's greatest industry, the citrus industry, but the state needs more such men—men who are familiar with the great needs of the state and men who by training and experience are competent to pass intelligently upon the economic problems which confront us.

ANNUAL MEETING FLORIDA STATE HORTICULTURAL SOCIETY (Continued from page 21)

ville Country Club at their command. Permission for playing can be secured through the secretary.

Ornamental Plant Section

On Wednesday, April 20th, the program on ornamental plants will be held separately from the regular program and will meet in Peabody Hall at 9:30 A. M. This program is given in co-operation with the Garden Club of Gainesville and will be one particular interest to those interested in the Garden Club work in this state.

Florida Rose Society

On Wednesday, April 20th, at 2:00 P. M. in Peabody Hall, the Florida Rose Society will hold its Seventh

THE CITRUS INDUSTRY

Annual meeting. A good 've program in reference to Rose Culture has been arranged. Members of the Horticultural Society are urged to bring their wives and families as there is something of interest to all on the various programs.

Florida Rose Show

The Seventh Annual Rose Show of the Florida Rose Society will be staged in the Hotel Thomas, opening at 5:00 P. M., Tuesday, April 19th and continuing through Wednesday, April 20th. Members of the Societies are urged to bring roses to enter in this Show. The American Rose Society is offering a bronze medal for the best exhibit in the amateur class. The directors of the Show will be W. L. Floyd and John V. Watkins, of the College of Agriculture, University of Florida, Gainesville.

Post Convention Trips

Trips to Tung Oil Plantings and other points of interest will be arranged for Friday morning, April 22, if sufficient number of members desire. These trips will be made un-

der the guidance of B. F. Williamson and J. McL. Ridgell, of the Gainesville Chamber of Commerce. Those wishing to make these trips should notify the Secretary.

Annual Dues

Those not planning to attend the meeting at Gainesville should send their membership dues (\$2.00) at once to Bayard F. Floyd, secretary at Davenport, Florida, to insure obtaining a copy of the printed proceedings for the meeting.

When a man wants a thing, he asks for it or attempts to take it by force. When a woman desires a thing, she pretends that she does not; and more often than the man, the woman attains her desires.

CITRUS NURSERY NEWS

We have for sale several hundred thousand Orange and Grapefruit trees of staple varieties on sour orange roots. Caliper $\frac{1}{2}$ to $3\frac{1}{2}$ inches. Fine stock. Must be sold. Write to us for prices.

Lake Nursery Company

Leesburg, Florida

"Black Leaf 40"

Kills APHIS and THRIPS

This "double acting" insecticide has been the favorite spray material of successful citrus growers for the past 20 years. It not only kills Aphids and Thrips by direct contact, but also by nicotine fumes. This is an advantage not possessed by any non-poisonous, non-volatile insecticide.

Recommended By Experiment Stations
"Black Leaf 40" enjoys the endorsement and recommendation of leading growers, Agricultural Colleges and Experiment Stations and editorial writers throughout the country. Being highly concentrated, this reliable insecticide is economical to use as a little goes a long way. Full directions appear on every package. Sold everywhere.

Tobacco By-Products & Chemical Corporation
LOUISVILLE Incorporated KENTUCKY

KILLS BY CONTACT AND FUMES



New Citrus Hybrids

(Continued from last month)
Umatilla Tangelo

(C. P. B. 52031—B—2; pl. 8)

Closely resembling some of the tangelos in general appearance are certain of the tangors, i. e., hybrids between mandarin oranges (*Citrus nobilis*) and the common sweet orange *C. sinensis*. The resemblance is so close that for horticultural purposes these tangors may well be discussed with the tangelo group, a class of fruits now fairly well recognized by citrus growers and rapidly acquiring market recognition.

Of special interest and promise is a fruit resulting from the pollination of a Satsuma orange with pollen of the Ruby orange (sometimes called Ruby Blood). This cross was made in the spring of 1911 at Eustis, Fla. Hybrids of this group have been fruiting for several years at Eustis, and one has attracted special attention because of its large, deep-colored, glossy fruit of attractive appearance and good holding quality. In contrast with the parents (the Satsuma, early maturing, and Ruby, midseason), this hybrid is decidedly

a late fruit, maturing in late February, March, and April, about the season of the King orange. It resembles the latter in shape and size, although it is much more attractive in appearance. The tree so strongly resembles the ordinary Satsuma in foliage and habit that but for the unique character of the fruit doubt might be raised as to its hybrid origin. The name Umatilla (Um-a-til' la) has been selected for this new fruit, after the town of that name in Lake County, Fla. For horticultural convenience it is classed with the tangelos.

(Continued next month)

The driver of a Ford sedan who was plainly out of his element in the city traffic, attempted to turn around in the middle of the block, and was side-swiped and upset by a hook and ladder fire truck on its way to answer a call.

Striding over to the overturned vehicle a traffic officer poked his head through the broken window and demanded, "What do you mean by blocking traffic like this? C'mon out-

ta there, you're pinched!"

"You let him alone!" said a female voice from the back seat. "How'd we know them drunken painters were going to run into us?"—Goblin.

MEXICAN FRUIT WORM QUARANTINE AMENDED

Effective March 5, an amendment to the rules and regulations supplemental to the Mexican fruit worm quarantine was announced today by Lee A. Strong, Chief of the Plant Quarantine and Control Administration, U. S. Dept. of Agriculture.

The amendment requires the sterilization of host fruits produced in the regulated area in Cameron, Willacy, and Hidalgo counties, in Texas before they may be moved to points in Alabama, Arizona, Arkansas, California, Florida, Georgia, Louisiana, Mississippi, Nevada, New Mexico, North Carolina, Oklahoma, Oregon, South Carolina, Tennessee, or Washington.

This limitation has been deemed advisable as an added precaution in protecting localities thought to be most susceptible to infestation by Mexican fruit worm. Light infestations have been found recently in the regulated area in Texas, and all of these have been cleaned up promptly.

A FREE BOOK EVERY GROWER AND SHIPPER SHOULD HAVE



CONTAINS complete information on ETHYLENE—the magic gas which hastens ripening of matured fruits. Learn how to profit with it. Ethylene increases profits, reduces loss, saves time. Write for your copy of "Ethylene for Coloring Matured Fruits and Vegetables" today.

CARBIDE AND CARBON CHEMICALS CORPORATION

30 East 42nd Street, New York City

1310 Santee Street, Los Angeles

114 Sansome Street, San Francisco, California

Warehouses in Los Angeles, Tampa, Jacksonville,
and other principal cities

Unit of Union Carbide  and Carbon Corporation

The Best Market In Florida

Is made up of the citrus growers of this state.

The logical medium through which to appeal to this group is

The Citrus Industry

because it is addressed solely to this group of readers.

A lot of advertisers have already learned this.

—A trial will convince you of the wisdom of this course.

CALCIUM REQUIREMENTS OF CITRUS

(Continued from Page 22)

tree more satisfactorily for a first application, they are too expensive for annual applications as compared with limestone. Mixtures of fertilizer and ground limestone are being offered by the trade and are proving satisfactory altho too expensive to justify general use. Where raw phosphate rock is cheap it is a very satisfactory source of calcium carbonate. It is probable that the principal advantage of this material is due to its calcium carbonate content, as I have seen no measurable responses from it except on acid soils. The other ma-

terials mentioned are not satisfactory because of the high cost.

I have heard much talk of the increased cost of fertilization because of the added cost of the lime, but nowhere have I seen mention of the greatly increased production and quality produced when soils are properly amended with calcium. I can assure you that ignoring this one element is costing the citrus growers of the state hundreds of thousands of dollars.

JOHN E. SANFORD IS NEW PRESIDENT OF ARMOUR FERTILIZER WORKS

John E. Sanford, Executive Vice President since 1922 has recently become President of the Armour Fertilizer Works. He succeeded Charles H. MacDowell, the first President of the Company, who retired recently after serving nearly forty

five years with Armour and Company and Armour Fertilizer Works.

Mr. Sanford, a native of Huntsville, Alabama, has spent more than a quarter century in the fertilizer industry. He began in 1904 as salesman for the Tennessee Chemical Company, Nashville, Tennessee, and when that Company was bought out by Armour Fertilizer Works in 1909 he continued with Armour. He served as Assistant Manager of Armour's Nashville office, manager of their Atlanta office and was made Southern Sales Manager supervising sales in all the southern states. In 1922 he was elected Executive Vice President with headquarters in Chicago.

Mr. Sanford is a member of the Board of Directors and the Executive Committee of the National Fertilizer Association. For many years he has been active in its work and has had a part in many of its constructive movements for agriculture and the industry.

Mr. MacDowell's retirement from active work after so many years of service to agriculture and industry recalls the prominent part he played in starting and developing the large business he headed, and his many contributions to the agricultural and chemical sciences.

CLASSIFIED

Advertisements

The rate for advertisements of this nature is only five cents per word for each insertion. You may count the number of words you have, multiply it by five, and you will have the cost of the advertisement for one insertion. Multiply this by the total number of insertions desired and you will have the total cost. This rate is so low that we cannot charge classified accounts, and would, therefore, appreciate a remittance with order. No advertisement accepted for less than 50 cents.

MISCELLANEOUS

DUSTER — Niagara, Air-Cooled engine Steel truck-mounted. Nearly new. Half price. Samuel Kidder, Monticello Fla.

SEEDS—ROUGH LEMON, SOUR ORANGE, CLEOPATRA. Pure, fresh, good germination. Also seedlings lineout size. De Soto Nurseries, DeSoto City, Fla.

FANCY ABAKKA pineapple plants. R. A. Saeger, Ankon, Florida.

HIGH BLOOD PRESSURE easily, inexpensively overcome, without drugs. Send address. Dr. J. B. Stokes, Mohawk, Fla.

CROTALARIA SPECTABILIS—Seed for sale. New crop, well cured, bright and clean. Price 25c per pound in 100 pound lots and over, 30c per pound in less quantities. F. O. B. Hastings, Bunnell, Lowell and San Antonio, Florida. F. M. LEONARD & COMPANY, Hastings, Florida.

SCENIC HIGHWAY NURSERIES has a large stock of early and late grapefruit and oranges. One, two and three year buds. This nursery has been operated since 1883 by G. H. Gibbons, Waverly, Fla.

RAISE PIGEONS—Profit and pleasure. Illustrated descriptive catalogue postage six cents. Vrana Farms, Box 314a, Clayton, Missouri.

WANTED—RESIDENT SOLICITORS

to contact Grape Fruit & Orange packers & shippers, for one of the oldest receivers and Auction Specialists in New York. Address "C.B." P. O. Box 415, Tampa, Florida.

CROTALARIA STRIATA SEED — hand picked, re-cleaned, high germination tested, native grown, select quality. Write for lowest current market prices. Roy Taylor, Bartow, Florida.

ORANGE PACKERS ATTENTION — Two chemical transparent flexible orange coating processes for sale; royalty or license basis. Patent pending. Dr. C. V. Berry, 251 West 111th Street, New York City.

PUREBRED PULLETS FOR SALE—White Leghorns and Anconas ready to ship. Barred Rocks and R. I. Reds shortly. Several hundred yearling White Leghorn hens now laying 70%. Write or wire for prices. C. A. Norman, Dr. 1440, Knoxville, Tenn.

LAREDO SOY BEANS, considered free from nematode, excellent for hay and soil improvement. Write the Baldwin County Seed Growers Association, Loxley, Alabama, for prices.

WANTED—To hear from owner of land for sale. O. Hawley, Baldwin, Wis.

SATSUMA BUDWOOD from Bearing Trees. Hills Fruit Farm, Panama City, Fla.

WANTED—To hear from owner having good farm for sale. Cash price, particulars, John Black, Chippewa Falls, Wisconsin.

SEED—Rough lemon, sour orange, cleopatra. New crop from type true parent trees. Also thrifty seedlings. DeSoto Nurseries, DeSoto City, Florida.

C. D. Kime

Consulting
Horticulturist

Grove Advisory Service,
Soil Investigations,
Research.

First National Bank Bldg.
P. O. Box 222
Phone 3489
ORLANDO

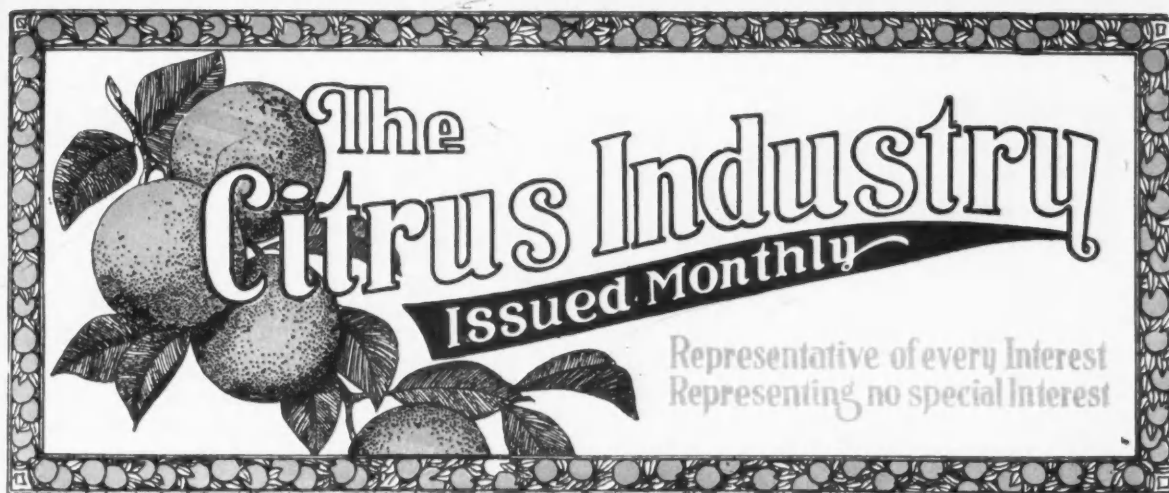
HOTEL HILLSBORO

Tampa, Fla.

TOP OF THE TOWN

European Plan, Fireproof 300 Rooms With Baths

THE CENTER OF TAMPA



Vol. 13, No. 5

TAMPA, FLORIDA, MAY, 1932

15 Cts. a Copy

You may best keep informed as to
news of the citrus industry as
a whole by reading

The Citrus Industry

every month. No other Florida publi-
cation is devoted exclusively
to citrus.

ASSOCIATED PUBLICATIONS CORPORATION, TAMPA, FLORIDA, PROPRIETORS OF:
THE CITRUS INDUSTRY - - - THE FISH AND OYSIER REPORTER - - - BARTOW PRINTING CO.

LIBRARY
FLORIDA EXPERIMENT STATION
GAINESVILLE, FLA.

LIBRARY FLA. AGRICULTURE EX. STA.



Be on Your Guard!



*There Are More Ways Than One
To Lose Your Profits*

Haphazard fertilization will steal the dollars out of your pockets just as surely as the thief who creeps in your grove at night and carries your fruit away.

It is an established fact that improper combinations of certain materials cause soil reactions that are harmful to your trees. Such reactions rob your soil of its vitality and take away your grove's ability to produce the crops to which you are entitled.

The makers of GULF BRANDS of FERTILIZER have studied Florida soils for more than twenty-eight years. Into GULF BRANDS go the plant foods essential to successful crop production. In addition, the elements are so blended as to insure lasting soil benefit.

Play safe! Insist on GULF BRANDS for your summer application.

The Gulf Fertilizer Company

TAMPA, FLORIDA

Field men at

Tampa, Clearwater, Bartow, Winter Haven, Wauchula, Bradenton,
Lake Wales, West Palm Beach, Orlando, Cocoa and Leesburg.

Features In This Month's Issue

Should Truck Movement of Citrus Be Encouraged or Discouraged?

By R. P. Burton

Culture of Pineapple Oranges In the High Pine Lands

By F. M. O'Byrne

The Agricultural Work Centered at Univ. of Florida

By Wilmon Newell and W. L. Floyd

Traffic Matters Of Importance to the Citrus Industry

By J. Curtis Robinson

Clitocybe Mushroom Root Rot of Woody Plants In Florida

By Dr. Arthur S. Rhoads

The Growers' Own Page

Not As Bad As Painted

Editorial

New Citrus Hybrids

By Walter T. Swingle, T. Ralph Robinson and E. M. Savage

Citrus Comments

By Chas. D. Kime

Impressions

By The Impressionist

Seald-Sweet



Mor-juce

The Trade Recognizes These Two Brands

—as the Standard of Florida Citrus Quality

This is no idle claim. It is supported by proof in dollars and cents from the most exacting markets of the country—the New York and Chicago auctions. The buyers in these two markets paid 21 cents a box more for Exchange brands throughout this season up to March 31. And the margin has been increasing since.

Here are the figures from the records of the auctions upon which to judge for yourselves:

NEW YORK AUCTION TO MARCH 31

Florida Citrus Exchange, 1,127,516 boxes	\$3.03
Competitors in Florida, 2,309,527 boxes	2.82
Margin in favor of the Exchange	21c

CHICAGO AUCTION TO MARCH 31

Florida Citrus Exchange, 280,174 boxes	\$2.86
Competitors in Florida, 248,736 boxes	2.65
Margin in favor of the Exchange	21c

Naturally, this favorable condition is repeated in the other markets for the New York and Chicago auctions are the barometers of price which the thousands of buyers follow closely day to day. The populous Central and Eastern areas swing up and down with New York; from Cleveland west and down the great valley of the Mississippi below St. Louis, Chicago's auction is the influence that dominates the trade.

There are good reasons why the trade pays this margin for the Exchange brands. They are the standards of quality, reliability and uniformity. Behind them is unwavering standard of grade and pack; the big volume necessary for regular supply; service in sales extending to the retailers; advertising that makes the brand names household words.

Why let indifference, prejudice or propaganda deprive you of this margin?

Florida Citrus Exchange

Tampa, Florida